

PATENT

--ABSTRACT

Compositions capable of simultaneous two-photon absorption and higher order absorptivities are disclosed. Many of these compositions are compounds satisfying the formulae d-A-D, A-A-A, D-A-D and A-D-A, wherein D is an electron donor group, A is an electron acceptor group and A comprises a bridge of B-conjugated bonds connecting the electron donor groups and electron acceptor groups. In A-D-A and D-A-D compounds, the B bridge is substituted with electron donor groups and electron acceptor groups. Also disclosed are methods that generate an electronically excited state of a compound, including those satisfying one of these formulae. The electronically excited state is achieved in a method that includes irradiating the compound with light. Then, the compound is converted to a multi-photon electronically excited state upon simultaneous absorption of at least two photons of light. The sum of the energies of all of the absorbed photons is greater than or equal to the transition energy from a ground state of the compound to the multi-photon excited state. The energy of each absorbed photon is less than the transition energy between the round state and the lowest single-photon excited state of the compound is less than the transition energy between the multi-photon excited state and the ground state.--